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The Races of *Agriades coridon* inhabiting the Albarracin Sierra and its vicinity.

By W. G. SHELDON, F.E.S.

In his paper in the November number of this magazine Dr. Chapman raises the question whether the two races of *Agriades coridon* occurring in this district interbreed, and mentions that since his visit there intermediate forms have been taken by myself; he further says, "they are in any case so rare that I came across none of them. Were the two forms one species, they ought to weld into one form with only occasional aberrations approaching the present extreme forms."

To take first Dr. Chapman's point of their rarity. At the time of my visit in 1905 intermediates between the two forms were not by any means rare.

My companion, Mr. E. F. S. Tylecote, and myself reached Albarracin on July 26th, and stayed until August 6th. On our arrival we found that Miss Fountaine had been staying in the town for several weeks, and she did not leave until considerably after the date of our departure.

Agriades coridon var. *aragonensis* was abundant and in good condition during the whole of our stay, in two localities in the vicinity of Albarracin; one of these was in the Guadalaviar Gorge, some five kilometres on the road leading to Teruel; and the other was the hill district known as Puerta de la Losilla, four kilometres south of the town. Flying with swarms of typical *aragonensis*, mixing freely with them, and easily distinguishable on the wing by their colour, were certain males, the depth and tint of blue of which agreed closely with typical *A. coridon*; they had, however, the light outer margins to the wings, with the ocelli showing on the upper side, which obtains in the majority of typical var. *aragonensis*. I have two of these forms, and I caught and rejected others that were damaged. Mr. Tylecote captured some, and Miss Fountaine at the date of our arrival had two or three examples, and I saw her afterwards release at least one imperfect one.

All my specimens of this form were taken at La Losilla, and I think Mr. Tylecote's were also, but certainly one or two of Miss Fountaine's were met with in the Guadalaviar locality. Altogether there

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must have been ten or a dozen examples of this form seen or captured by the three of us.

In addition to the above described forms, there was quite a number of males which were intermediate in colour between them and typical var. *aragonensis*. Of the three or four dozen male *A. coridon* that I brought away from Albarracin, speaking from memory, I should say that these were about a dozen in number; I have several of them at present in my series.

Of the typical var. *hispana* only one example was met with in the neighbourhood of Albarracin by the three collectors. This was taken by myself, alongside the banks of the Guadalaviar, about one kilometre nearer Albarracin than the locality for var. *aragonensis*, on August 4th. Its behaviour was very different from that which is usual with the species, which generally flies backwards and forwards over a very limited extent of ground, frequently settling on flowers. It was flying swiftly, at a height of several feet, down the gorge towards the *aragonensis* locality, not hesitating in any way, nor stopping at flowers or other attractions; it impressed me at the time as behaving like an insect that was impelled by some migratory instinct, or one that had lost its parent colony and was anxious to find another as soon as possible. It is not by any means a fresh specimen, and the left inferior is torn and has a portion missing.

With regard to Dr. Chapman's second point, that were the two forms one species they ought to weld into one form with only occasional aberrations. This would I think depend upon circumstances. If there are two colonies occupying practically the same ground, the individuals of one colony mingling and pairing freely with those of the other, one would expect that in the process of time one form would become common to both colonies, but if there are colonies of the two forms some little distance apart, and they do not mingle freely—and of course *A. coridon* is a species which has colonies over an extent of an acre, or even less, and one can find them abundant in this area year by year, whereas there is hardly a specimen to be found outside this area for a distance of many miles—but occasional examples of one form mingle and pair with the opposite sex of the other form, then I should expect to see a limited number of intermediates; and if the two forms were one species, and fertile, then I should expect to find specimens exhibiting characters between the intermediate and the prevalent form, which would be the result of further crossings.

Now let us see what evidence there is in support of the view that the specimens taken by Miss Fountaine, Mr. Tylecote, and myself, at Albarracin, which were intermediate in colour between var. *aragonensis* and *hispana*, were the results of crossing between the two forms. I think that without any other evidence than the laws of probability, there is strong reason to believe they were. However, there is I think very good evidence in support of my contention which has been supplied by Dr. Chapman himself.

In his account of the expedition which he made to the Albarracin district in 1901, he says (see *Ent. Record*, vol. xiv., p. 119), "The two forms of *A. corydon* taken, the violet coloured form *corydonius* (= var. *hispana*), and the pale var. *hispana* (= var. *aragonensis*), are very distinct, and no intermediate specimens were observed. They occurred on the same ground to some extent at Albarracin, but in reality they

occupied distinct areas, and the cases of their occurring on the same ground was of the nature of overlapping."

This seems just the condition likely to produce occasional crossings and consequent intermediates between the forms of one species.

Dr. Chapman, in his article quoted above, notes that var. *aragonensis* was found on limestone, whereas var. *hispana* was not. It is true that Puerta de la Losilla, where I think both forms were met with by him, is not strictly speaking on limestone, which has in the neighbourhood a cap of red sandstone, but in places this rock is worn very thin by the action of water, and I noticed in one or two spots the limestone plants were abundant.

My own experience was very similar, var. *aragonensis* was only found amongst limestone plants, var. *hispana* on the contrary—with the exception of the one wandering example before noted—was confined to an igneous stratum, the exact nature of which I am not certain.

I found it abundant on the hills to the west of the village of Noguera, which is situated some fifteen miles west of Albarracin. The vegetation here was entirely different from that of the limestone formation on which var. *aragonensis* is found, and included vast thickets of *Cistus ladaniferus*, in the clearings between which var. *hispana* occurred freely. Its headquarters was a sunny slope of perhaps two or three acres, about two miles from the village; here these beautiful creatures were flying in hundreds, and one could catch a dozen or so with a sweep of the net.

It may perhaps be said, if there were intermediates between *hispana* and *aragonensis* in the vicinity of Albarracin in 1905, how was it that there were none observed in 1901? and if *hispana* was not infrequent in 1901 how was it that (with the exception of a single wanderer) it was not seen in 1905? To which I would reply, that I think it probable we did not tap Dr. Chapman's locality in which he found *hispana* and *aragonensis* frequenting adjoining ground but keeping apart; or his colony of *hispana*, presumedly a weak one, may have died out so far as pure specimens were concerned, and have only been represented by intermediates, the results of crossings in previous years. It is of course possible that there had not been any crossings the year previous to 1901, or that there were for other reasons not any intermediates in evidence in that year.

Lying before me as I write is a geological map of the district I am discussing. It shows a remarkably diverse arrangement of the strata, and I cannot help thinking that there must be a strong colony, and probably several, of *hispana*, in the neighbourhood, at present undiscovered, and which was the source of the small numbers of that form which have been seen or captured.

Lepidopterology.*

By T. A. CHAPMAN, M.D., F.E.S.

This volume is in quarto, no doubt owing to the exigencies of having plates large enough to show of natural size the gigantic moths

* Études de Lépidoptérologie Comparée, Fasc. XIbis. Contributions à l'étude des Grands Lépidoptères d'Australie (Genres *Coscinocera* et *Xyleutes*) par Charles Oberthür, Constant Houlbert, et F. P. Dodd.